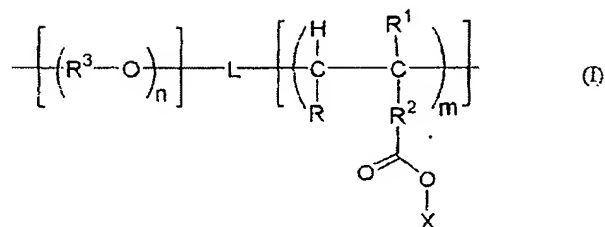


IN THE CLAIMS

1. (Original) A block copolymer comprising the unit (I)



wherein:

R is selected from the group consisting of hydrogen, C₁-C₁₈ alkyl, C₂-C₁₈ alkenyl, C₇-C₁₈ aralkyl, C₇-C₁₈ alkaryl, C₆-C₁₈ aryl, carboxylic acid, C₂-C₁₈ alkoxycarbonyl, C₂-C₁₈ alkaminocarbonyl, or any one of C₁-C₁₈ alkyl, C₂-C₁₈ alkenyl, C₇-C₁₈ aralkyl, C₇-C₁₈ alkaryl, C₆-C₁₈ aryl, C₂-C₁₈ alkoxycarbonyl and C₂-C₁₈ alkaminocarbonyl substituted with a heteroatom within, or attached to, the carbon backbone;

R¹ is selected from the group consisting of hydrogen and C₁-C₆ alkyl groups;

R² is a linking group;

X is an electron withdrawing group;

R³ is selected from the group consisting of C₁-C₁₈ alkylene, C₂-C₁₈ alkenylene, C₇-C₁₈ aralkylene, C₇-C₁₈ alkarylene and C₆-C₁₈ arylene;

L is a divalent linker joining the blocks;

and m and n are each an integer of greater than 1.

2 – 37. (Cancelled)

38. (New) The block copolymer according to claim 1 in which m and n are integers of 5 to 300.

39. (New) The block copolymer according to claim 1 which has a polydispersity of less than 1.4 and a molecular weight (Mw) of less than 100,000.

40. (New) The block copolymer according to claim 1 which is water soluble.

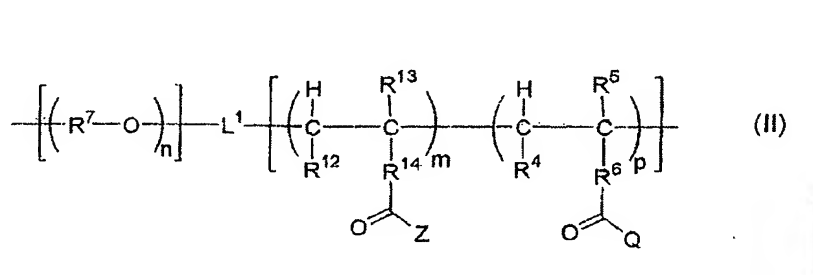
41. (New) The block copolymer according to claim 1 in which X is a carboxylate activating group selected from the group consisting of N-succinimidyl, pentachlorophenyl, pentafluorophenyl, para-nitrophenyl, dinitrophenyl, N-phthalimido, norbornyl, cyanomethyl, N-pyridyl, N-trichlorotriazine, 5-chloroquinilino, and N-imidazole.
42. (New) The block copolymer according to claim 1 in which R is selected from the group consisting of hydrogen, C1-C6 alkyl, C1-C6 alkenyl, C1-C6 aralkyl and C1-C6 alkaryl, C2-C8 alkoxycarbonyl, and C2-C8 alkaminocarbonyl.
43. (New) The block copolymer according to claim 1 in which R¹ comprises a moiety selected from the group consisting of hydrogen, methyl, ethyl, propyl, butyl, and pentyl or isomers thereof.
44. (New) The block copolymer according to claim 1 in which R² is a bond or a divalent group selected from a carbonyl, C1-C18 alkylene and/or C6-C18 arylene group which may be substituted with 1 or more heteroatoms.
45. (New) The block copolymer according to claim 44 in which R² is selected from the group consisting of C1-C6 alkylene, C6-C12 arylene, C1-C12 oxyalkylene and carbonyl-C1-C6 alkylene.
46. (New) The block copolymer according to claim 45 in which R² is selected from the group consisting of methylene, 1,2-ethylene, 1,3-propylene, hexylen, octylene, benzylen, tolylene and xylylene.
47. (New) The block copolymer according to claim 1 in which the R³ groups, which may be all the same or different from one another, comprise C1-C8 alkylene groups.
48. (New) The block copolymer according to claim 47 in which all R³ groups are the same and comprise a moiety selected from the group consisting of 1,2-ethylene and 1,2-propylene.

49. (New) The block copolymer according to claim 1 in which L comprises a C1-C18 alkylene or C6-C18 arylene group which may be substituted and/or interrupted with 1 or more heteroatoms.

50. (New) The block copolymer according to claim 49 in which L is selected from the group consisting of C1-C6 alkylene, C6-C12 arylene, C1-C12 oxyalkylene and C1-C6 acyl.

51. (New) The block copolymer according to claim 50 in which L comprises a $-\text{COR}^a$ group, wherein R^a is selected from the group consisting of C1-C6 alkylene and C8-C12 arylene.

52. (New) The block copolymer according to claim 1 which comprises the structure (II)



wherein:

R^4 is selected from the group consisting of hydrogen, C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl, C6-C18 aryl, carboxylic acid, C2-C18 alkoxy carbonyl, C2-C18 alkaminocarbonyl, or any one of C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl, C6-C18 aryl, C2-C18 alkoxy carbonyl, and C2-C18 alkaminocarbonyl substituted with a heteroatom within, or attached to, the carbon backbone;

R^5 is selected from the group consisting of hydrogen and C1-C6 alkyl groups;

R^6 is a linking group;

Q is a solubilising group selected from the group consisting of hydroxyl, C1-C12 alkyl, C2-C12 alkenyl, C7-C12 aralkyl, C7-C12 alkaryl, C1-C12 alkoxy, C1-C12 hydroxyalkyl, C1-C12 alkylamino, C1-C12 hydroxyalkylamino, or any one of C1-

C12 alkyl, C2-C12 alkenyl, C7-C12 aralkyl, C7-C12 alkaryl, C1-C12 alkoxy, C1-C12 hydroxyalkyl, C1-C12 alkylamino, C1-C12 alkylamino substituted with an amine, hydroxyl, carbonyl or thiol group;

R^7 is selected from the group consisting of C1-C18 alkylene, C2-C18 alkenylene, C7-C18 arakylene, C7-C18 alkarylene and C6-C18 arylene;

n, m and p are each an integer of greater than 1;

R^{12} is selected from the group consisting of hydrogen, C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl, C6-C18 aryl, carboxylic acid, C2-C18 alkoxycarbonyl, C2-C18 alkaminocarbonyl, or any one of C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl, C6-C18 aryl, C2-C18 alkoxycarbonyl, and C2-C18 alkaminocarbonyl substituted with a heteroatom within, or attached to, the carbon backbone;

R^{13} is selected from the group consisting of hydrogen and C1-C6 alkyl groups;

R^{14} is a linking group;

L^1 is a divalent linker joining the blocks;

Z is a pendent group selected from the group consisting of $OM_{1/d}^{d+}$, NR^8R^9 , SR^{10} , OR^{11} and OX, wherein X is defined above, M is a metal ion and d is an integer of 1 or 2,

R^8 comprises an alkyl group, preferably an aminoacyl substituted alkyl group, more preferably a oligopeptidyl group;

R^9 is selected from hydrogen, C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl;

R^{10} and each R^{11} comprise a group which is individually selected from the group consisting of hydrogen, C1-C12 alkyl, C2-C12 alkenyl, C7-C12 aralkyl, C7-C12 alkaryl and C1-C12 hydroxyalkyl, and may contain one or more cleavable bonds and may comprise a bioactive agent.

53. (New) The block copolymer according to claim 52 in which Z comprises one or more aminoacyl groups.

54. (New) The block copolymer according to claim 53 in which Z comprises a glycine-leucine-phenylalanine-glycine linker.

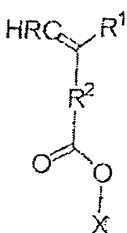
55. (New) The block copolymer according to claim 52 in which Z comprises a cis-aconityl group.

56. (New) The block copolymer according to claim 52 in which Z comprises a bioactive agent or linker.

57. (New) The block copolymer according to claim 56 in which the bioactive agent is an anti-cancer agent.

58. (New) The block copolymer according to claim 52 in which Q comprises an amine group attached to the R⁶CO carbonyl carbon.

59. (New) A process for the production of a block copolymer, comprising the polymerisation of ethylenically unsaturated monomers including a compound (III)



(III)

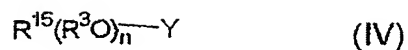
wherein R is selected from the group consisting of hydrogen, C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl, C6-C18 aryl, carboxylic acid, C2-C18 alkoxy carbonyl, C2-C18 alkaminocarbonyl, or any one of C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl, C6-C18 aryl, C2-C18 alkoxy carbonyl, and C2-C18 alkaminocarbonyl substituted with a heteroatom within, or attached to, the carbon backbone;

R¹ is selected from the group consisting of hydrogen and C1-C6 alkyl groups;

R² is a linking group;

X is an electron withdrawing group;

in the presence of an initiator compound (IV)

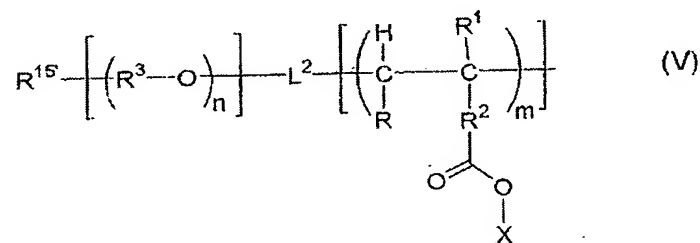


wherein n is an integer of 1 or more and Y is a radical initiating group;

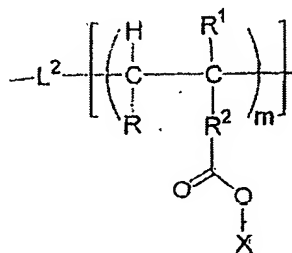
R³ is selected from the group consisting of C1-C18 alkylene, C2-C18 alkenylene, C7-C18 aralkylene, C7-C18 alkarylene and C6-C18 arylene;

R¹⁵ comprises a group selected from the group consisting of hydrogen, C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl and C6-C18 aryl, C1-C18 alkoxy, C2-C18 alkenyloxy, C7-C18 aralkoxy, C7-C18 alkaryloxy, C6-C18 aryloxy and -O-Y;

to produce a block copolymer comprising the unit (V)



wherein m and n are as defined above and L² is a divalent linking group derived from Y and R^{15'} is R¹⁵, or where R¹⁵ is -O-Y, R¹⁵ is



60. (New) The process according to claim 59 in which the groups X, R, R¹, R² and R³ are as defined as follows:

R is selected from the group consisting of hydrogen, C₁-C₁₈ alkyl, C₂-C₁₈ alkenyl, C₇-C₁₈ aralkyl, C₇-C₁₈ alkaryl, C₆-C₁₈ aryl, carboxylic acid, C₂-C₁₈ alkoxy carbonyl, C₂-C₁₈ alkaminocarbonyl, or any one of C₁-C₁₈ alkyl, C₂-C₁₈ alkenyl, C₇-C₁₈ aralkyl, C₇-C₁₈ alkaryl, C₆-C₁₈ aryl, C₂-C₁₈ alkoxy carbonyl and C₂-C₁₈ alkaminocarbonyl substituted with a heteroatom within, or attached to, the carbon backbone;

R¹ is selected from the group consisting of hydrogen and C₁-C₆ alkyl groups;

R² is a linking group;

X is an electron withdrawing group;

R³ is selected from the group consisting of C₁-C₁₈ alkylene, C₂-C₁₈ alkenylene, C₇-C₁₈ aralkylene, C₇-C₁₈ alkylene and C₆-C₁₈ arylene;

and wherein the block copolymer has a polydispersity of less than 1.4 and a molecular weight (Mw) of less than 100,000.

61. (New) The process according to claim 59 in which Y is a -COR^Y group, wherein R^Y is selected from the group consisting of halogen substituted C₁-C₆ alkyl or C₆-C₁₂ aryl.

62. (New) The process according to any of claim 59 in which L² is selected from the group consisting of C₁-C₆ alkylene, C₆-C₁₂ arylene, C₁-C₁₂ oxyalkylene and carbonyl-C₁-C₆ alkylene, wherein R^a is selected from the group consisting of C₁-C₆ alkylene and C₆-C₁₂ arylene.

63. (New) The process according to claim 59 in which R¹⁵ is selected from hydrogen C₁-C₆ alkyl, C₁-C₆ alkoxy, C₂-C₁₀ alkenyl, C₇-C₁₀ aralkyl, C₇-C₁₀ alkaryl and C₆-C₁₀ aryl and -O-Y.

64. (New) The process according to claim 59 which is a controlled radical polymerisation process.

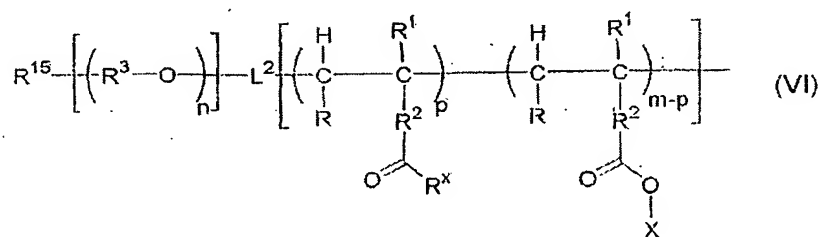
65. (New) The process according to claim 59 in which comonomers are copolymerised with the monomer of the formula III.

66. (New) The process according to claim 59 in which the block copolymer of the formula V is reacted further with a reagent HR^x , wherein

R^x is selected from the group consisting of NR^{19} , R^{20} , SR^{21} and OR^{22} , wherein R^{19} comprises a linker group;

R^{20} is selected from hydrogen, C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl, C6-C18 aryl;

R^{21} and R^{22} are selected from the group consisting of hydrogen, C1-C12 alkyl, C1-C12 alkenyl, C1-C12 aralkyl, C1-C12 alkaryl, C1-C12 alkoxy and C1-C12 hydroxyalkyl, any of which may comprise a bioactive agent substituent and/or may contain one or more cleavable bonds, to form a derivatised block-copolymer having the structure (VI)

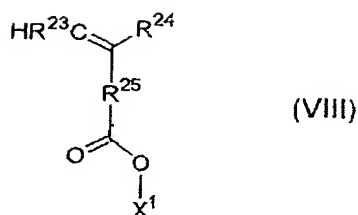


wherein $1 \leq p \leq m$.

67. (New) The process according to claim 66 in which HR^x is H_2NR^2 and wherein R^2 comprises an aminoacyl linker or a cis-aconityl linker and a bioactive agent or a ligand.

68. (New) The process according to claim 66 in which the block copolymer of the formula VI is quenched by reacting remaining groups $-\text{COOX}$ with an amine group-containing compound.

69. (New) The process for the production of a block copolymer, comprising the steps of polymerising ethylenically unsaturated monomers comprising a compound (VIII)



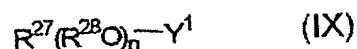
wherein R^{23} is selected from the group consisting of hydrogen, C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl, C6-C18 aryl, carboxylic acid, C2-C18 alkoxy carbonyl, C2-C18 alkaminocarbonyl, or any one of C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl, C6-C18 aryl, C2-C18 alkoxy carbonyl, and C2-C18 alkaminocarbonyl substituted with a heteroatom within, or attached to, the carbon backbone;

R^{24} is selected from the group consisting of hydrogen and C1-C6 alkyl groups;

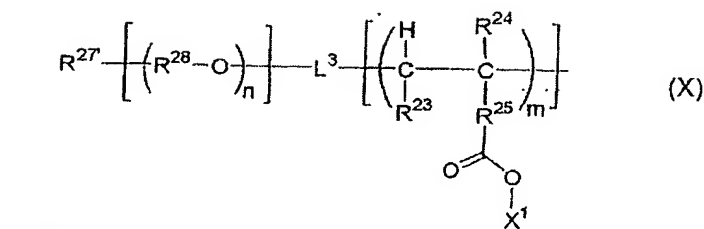
R^{25} is a linking group;

X^1 is selected from the group consisting of carboxyl activating groups, hydrogen, $\text{M}_{1/d}^{d+}$ and carboxyl protecting groups, wherein M^1 is a metal ion and d is an integer of 1 or 2;

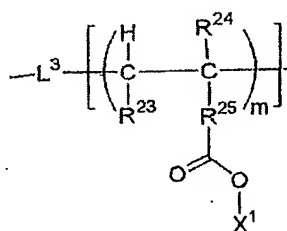
R^{26} is selected from the group consisting of C1-C18 alkylene, C2-C18 alkenylene, C7-C18 aralkylene, C7-C18 alkarylene and C6-C18 arylene; in the presence of an initiator compound (VIII)



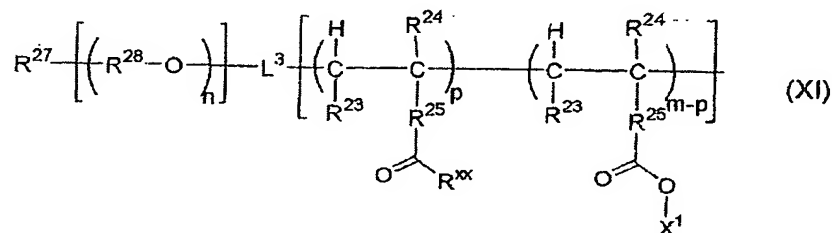
wherein n is an integer of 1 or more and Y^1 is a radical initiating group comprises a group selected from the group consisting of hydrogen, C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl and C6-C18 aryl, C1-C18 alkoxy, C2-C18 alkenyloxy, C7-C18 aralkoxy, C7-C18 alkaryloxy, C6-C18 aryloxy and $-\text{O}-\text{Y}^1$; and R^{28} is selected from the group consisting of C1-C18 alkylene, C2-C18 alkenylene, C7-C18 aralkylene, C7-C18 alkarylene and C6-C18 arylene; to produce a block copolymer comprising the unit (X)



wherein m is an integer of greater than 1 and L^3 is a divalent linking group derived from L^3 ; and R^{27} is R^{27} , or where R^{27} is -O-Y1, R^{27} is

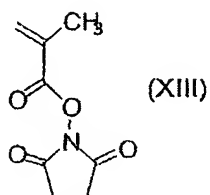


and reacting (X) with a reagent HR^{xx} , wherein R^{xx} is selected from the group consisting of NR^{29} , R^{30} , SR^{31} and OR^{32} , wherein R^{29} is a linker group; R^{30} is selected from hydrogen, C1-C18 alkyl, C2-C18 alkenyl, C7-C18 aralkyl, C7-C18 alkaryl, C6-C18 aryl; R^{31} and R^{32} are individually selected from the group consisting hydrogen, C1-C12 alkyl, C1-C12 alkenyl, C1-C12 aralkyl, C1-C12 alkaryl, C1-C12 alkoxy and C1-C12 hydroxyalkyl, and may contain one or more cleavable bonds, to form a derivatised block copolymer having the structure (XI)

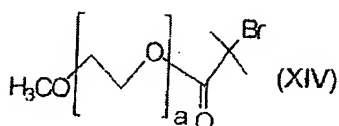


wherein $1 \leq p \leq m$.

70. (New) The process according to claim 59 in which the ethylenically unsaturated monomer compound is



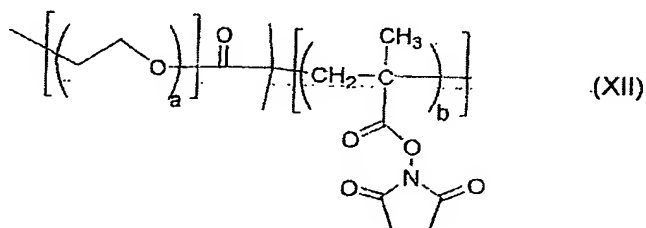
and the initiator is



in which a is 1 to 500.

71. (New) The process according to claim 70 in which the copolymer is reacted with a compound H_2N -Gly-Leu-Phe-Gly-Doxorubicin and in which the product is reacted with 2-hydroxy-propylamine.

72. (New) A block copolymer according to claim 1 having the structure (XII)



wherein a and b are integers of up to 500.

73. (New) A block copolymer which is obtainable by reacting the block copolymer of claim 36 and a reagent selected to provide a pendant group comprising anaminoacyl linker or a cis-aconityl linker and a bioactive agent.